

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the previous amendments and following remarks.

The claims currently pending in this application are Claims 1, 3-5, 7, 8 and 10-21. Claims 1, 5 and 8 are the only independent claims.

As explained previously, the subject matter disclosed and claimed in this application involves the manufacture of a packaging laminate having a thermoplastic layer, with laser-burned perforations formed in the laminate. During perforation of the packaging laminate by laser burning, residual thermoplastic material tends to build up around the perforations. This residual material exhibits itself by protruding outwardly from the laminate surface. When the laminate is subsequently subjected to processing operations, the residual material can interfere with other processing equipment such as the roller through which the laminate passes. This may lead to a build up of material on the roller, thus requiring frequent cleaning and maintenance.

Recognizing this, the inventor here developed the claimed subject matter at issue here. In one respect, the inventor developed a method of manufacturing a laminate with laser-burned perforations involving compressing the laminate (e.g., the core) before the laser-burning perforation operation in the region to be perforated. The compression is performed so that the build-up of residual thermoplastic material resulting from the laser burning perforation is located substantially entirely below the level of the surrounding surface of the packaging laminate. Thus, difficulties such as those discussed in the background portion of the present application are avoided.

As set forth in independent Claim 1, the method involves coating the first side of a material web of paper or paperboard with an outer layer of thermoplastic material, and thereafter forming a perforation line on the thermoplastic coated first

side of the packaging laminate through laser-burning. After the coating with the thermoplastic material, but before the formation of the perforation, the first side of the packaging laminate is compressed to form a compression line in which the core layer is compressed. It is in this compression line that the perforation line is laser burned. The compression is performed such a build-up of thermoplastic residual material around the perforation line, after the laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate on the first side. As recited in Claim 1, the core layer is compressed by at most 70%, and at least 20%.

The packaging laminate recited in independent Claim 8 comprises a core layer of paper or paperboard as well as a thermoplastic coating layer on a first side of the core layer, with a laser-burned perforation line through the core layer and the thermoplastic layer, and a build-up of thermoplastic residual material around the perforation line. The perforation line is disposed in a compression line on the first side of the packaging laminate. In the compression line, the core layer is compressed relative to the surrounding region of the packaging laminate. The compression line and the perforation line are configured relative to one another so that the build-up of thermoplastic residual material around the perforation line is substantially located entirely below the level of the surrounding surface of the packaging laminate which surrounds the compression line. The compression line is formed before the perforation line, and the core layer is compressed in the compression line by at most 70%, but at least 20%, in relation to its thickness surrounding the compression line.

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The Official Action sets forth a rejection of independent Claims 1 and 8 based on the disclosure in U.S. Patent No. 6,007,756 to Weiteder et al. (Weiteder) in view of the disclosure in U.S. Patent No. 4,834,244 to Masui.

As discussed previously, Weiteder discloses a process for producing perforations and/or semi-cuts in printed multi-layer composite material through use of a laser beam. The disclosed method involves cutting a sheet of multi-layer material into individual cut shapes, followed by forming perforations and/or semi-cuts. The Official Action recognizes that Weiteder does not disclose compressing a packaging laminate before forming laser-burned perforations, and does not disclose compressing the laminate such that the build-up of thermoplastic residual material around the perforation line after laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate.

As part of the fact-finding associated with the prior art rejection, the Official Action refers to Masui's disclosure of a case 11 that houses tissues. The case 11 includes perforations 13 that allow a portion 14 of the case lid surrounded by the perforations 13 to be removed by tearing along the perforations. The patent recognizes that un-perforated gaps exist between the individual perforations, and these un-perforated gaps can sometimes make it difficult to guide the tearing operation. That is, the gaps between adjacent perforations can make it difficult to guide the tearing force from one perforation to the next, and so the tearing force may deviate from the direction of the perforations. For this reason, Masui proposes adding a ruled line 18. One embodiment of the ruled line 18 is shown in Figs. 3 and 4 and involves an embossed ruled line 18. In the second form illustrated in Figs. 5 and 6, the ruled lines 18 are in the form of compressed regions on opposite sides of the case wall.

The Official Action takes the position that it would have been obvious, in view of the disclosure in Masui, to provide Weiteder's material with a ruled line in the area of the perforations. As stated in the Official Action, the reason for providing a ruled line in the area of Weiteder's perforations is "to weaken the non-perforated portions of the paperboard core layer of the packaging laminate."

However, the factual findings in the Official Action fail to establish one of the claimed aspects of the method and laminate recited in Claims 1 and 8. That is, neither reference discloses, together with the other claimed subject matter, a compression line and perforation line formed in relation to one another such that the build-up of thermoplastic residual material around the perforation line after laser burning will substantially be located entirely below the level of the surrounding surface of the packaging laminate.

Paragraph "8" of the Official Action comments that Masui's compression line, combined with Weiteder's laser perforation would provide the laminate as recited. The Official Action is completely devoid of any discussion about why combining Masui's compression line and Weiteder's laser perforation would necessarily and without question result in the build-up of thermoplastic residual material around the perforation line (i.e., the build-up of thermoplastic residual material around the perforation line following laser burning) being substantially located entirely below the level of the surrounding surface of the packaging laminate. The statement in the Official Action is nothing more than a conclusory statement unsupported by evidence of record.

It is clear from a study of Weiteder and Masui that neither reference is concerned about making sure that the thermoplastic residual material around the perforations in Weiteder do not extend above the level of the surrounding surface of

the packaging laminate. Consequently, if one were to apply Masui's compression to the laminate disclosed in Weiteder, the expected result would not be a compression line and perforation line that are configured in relation to one another in the manner recited in Claims 1 and 8. Indeed, if one implemented Masui's compression in Weiteder's laminate, one would do so consistent with Masui's reason for providing compression in perforated areas – to facilitate guidance of the tearing force along the perforations. This is not a situation where the claimed relationship set forth in Claims 1 and 8 is the predictable result of incorporating Masui's rule line into the laminate disclosed in Weiteder.

Paragraph "8" of the Official Action also states that it would have been obvious to optimize the amount of compression of the paperboard in order to control the frangibility of the laminate along the perforations. It is not entirely clear why this point is relevant here. If the Official Action means to suggest that optimizing the amount of compression to control tearing would necessarily result in the relationship recited in Claims 1 and 8 (i.e., the build-up of thermoplastic residual material around the perforation line after the laser burning being substantially located entirely below the level of the surrounding surface of the packaging laminate), that suggestion is misguided and nowhere supported by the record.

If an ordinarily skilled artisan was interested in optimizing the compression described by Masui, one would do so in a manner consistent with what Masui describes. That is, one would optimize the compression described by Masui to facilitate tearing along the perforations as discussed in Masui. However, the Official Action has not established that optimizing the amount of compression for purposes of facilitating tearing equates to the arrangement recited in Claims 1 and 8. That is, the Official Action has not established that the optimum amount of compression for

facilitating the tearing described in Masui is necessarily the same compression that would achieve the relationship set forth in Claims 1 and 18. Absent such a showing, the comments in the Official Action concerning optimizing are nothing more than speculation and conjecture.

On this point, it is also relevant to note that Masui discloses and illustrates in Fig. 6 compressing the laminate material on both sides to achieve the desired compression that will facilitate tearing along the perforation. It should be rather easy to appreciate that it would be possible to achieve a certain degree of compression of Masui's laminate on both sides to guide the tearing force along the perforations without also meeting the arrangement recited in Claims 1 and 8.

Paragraph "33" of the Official Action states that no evidence has been presented establishing that compression before or after laser perforation produces a materially different product. This comment indicates that the present application has not been read and claimed subject matter at issue here has not actually been considered. The background portion of the present application mentions that the difficulties created by the build-up of thermoplastic residual material around the perforation line might be addressed by trying to remove the build-up of thermoplastic residual material after-the-fact (e.g., by grinding). However, as the present application points out, this after-the-fact removal has the potential for creating its own set of problems. Similarly, it is not particularly desirable to carry out an after-the-fact compression step to try to compress the build-up of the thermoplastic residual material around the perforation line.

Here, the inventor does not seek to remove or eliminate the build-up of thermoplastic residual material after it has been formed, but rather implements a solution that has the affect of accommodating the build-up of thermoplastic residual

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material. By compressing the packaging laminate in advance of the perforation formation, negatively effects that might result from trying to remove or eliminate the build-up of thermoplastic residual material after-the-fact are avoided.

Of course, in the case of Masui and Weiteder, it makes little difference whether the laminate is compressed before or after formation of the perforations because the purpose for the compression is simply to facilitate guidance of the opening force along the perforation.

In the event the Official Action continues to believe the disclosure in Masui is relevant to the claims here, the Examiner is kindly asked to explain the basis for concluding that combining Masui's compression with Weiteder's perforations would necessarily result in the compression line and the perforation line being formed in relation to one another such that a build-up of thermoplastic residual material around the perforation line after the laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate on the first side.

It is respectfully submitted that independent Claims 1 and 8 are patentably distinguishable over the combined discloses in Weiteder and Masui.

The Official Action also sets forth a rejection of Claims 1 and 8 based on the disclosure in U.S. Patent No. 3,909,582 to Bowen in view of the disclosure in Masui. The issues here are similar to those discussed above. Bowen discloses a method of forming a line of weakness in a multi-layer laminate. The patent describes the use of a laser to form the line of weakness in at least one layer, but not all layers, of the multi-layer laminate.

As in the case of Weiteder discussed above, Bowen does not describe also compressing the packaging laminate to form a compression line along which the perforation line is subsequently formed, with the compression line and the

perforation line being formed in relation to one another such that a build-up of thermoplastic residual material around the perforation line after laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate.

The rejection here seems to be premised on the same unsupported conclusions relied upon in the rejection discussed above. That is, the Official Action here states that the "compression line taught by Masui combined with the laser perforation taught by Weiteder [sic-Bowen] would provide a laminate as recited in claims 1 and 8". The Official Action apparently once again believes that simply combining the disclosures in Masui and Bowen would necessarily result in a compression line and perforation line formed in relation to one another such that the build-up of thermoplastic residual material around the perforation line after laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate. For reasons similar to those discussed above, this conclusion is not well-founded and lacks sound reasoning. That Masui describes compressing fiberboard to help guide the tearing direction of a perforation in a laminate in no way discloses the particular relationship recited in independent Claims 1 and 8 – the compression line and the perforation line being formed in relation to one another such that the build-up of thermoplastic residual material around the perforation line after laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate. As discussed above, the Official Action here has not established that optimizing the amount of compression of the paperboard for the purpose stated in Masui (i.e., to control the direction of tearing along the perforation) would necessarily result in the compression line and perforation line being formed in relation to one another such that the build-up of

thermoplastic residual material around the perforation line after laser burning is substantially located entirely below the level of the surrounding surface of the packaging laminate. Absent evidence establishing this is necessarily so, the rejection cannot stand.

It is thus respectfully submitted that the rejection of independent Claims 1 and 8 based on a combination of the disclosures in Bowen and Masui does not establish a *prima facie* case of unpatentability of the invention defined in Claims 1 and 8.

The Official Action additionally sets forth a rejection of independent Claims 1, 5 and 8 based on the combination of Bowen and Masui, and further in view of the disclosure in U.S. Patent No. 1,126,816 to Mayall. This tertiary reference is relied upon for its disclosure of a machine for carrying out operations on material. The Official Action takes the position that it would have been obvious to utilize this machine to produce the modified laminate disclosed in Bowen. However, as explained in the earlier response, Mayall does not disclose a compression tool including a roller having a projection and a counter roller displaying a smooth circumferential surface as claimed. The Official Action appears to take the position that this difference amounts to an "obvious substitution of equivalents to yield a predictable result." The basis for that position is not understood or explained. Presumably, in the implementation of the machine disclosed in Mayall, it would be necessary to utilize an arrangement that would permit implementation of Masui's disclosure of ruled lines on opposite sides of the material as illustrated in Masui's Fig. 6. That is, Masui describes providing opposite surfaces of a sheet material with rule lines 18 to facilitate tearing of the material. Thus, Mayall's machine would be configured to impart rule lines 18 to opposite surfaces of Bowen's materials. To do so, one would not implement an arrangement including a roller displaying a

projecting compression portion and a counter roller displaying a smooth circumferential surface as claimed. The reason is because the smooth circumferential surface on the counter roller would not produce the ruled line on the opposite surface of the material as shown in Fig. 6 of Masui. Thus, contrary to the conclusory statement in the Official Action, this is not an obvious substitution of equivalents to yield a predictable result.

To the extend the Examiner continues to have contrary thoughts on this point, the Examiner is kindly asked to explain how one would expect to produce Masui's ruled lines 18 on opposite surfaces of the Bowen's material while utilizing a roller with a projecting compression portion and a counter roller with a smooth circumferential surface. It is noted in this regard that the wording in Claim 5 has been clarified to avoid any possible interpretation that the phrase "smooth circumferential surface" could encompass a projecting compression portion.

It is respectfully submitted that the independent claims here are patentably distinguishable over a combination of the disclosures in Bowen, Masui and Mayall.

The dependent claims define additional distinguishing aspects associated with the claimed method, plant and packaging laminate.

Early and favorable action concerning this application is respectfully requested.

The remaining dependent claims ultimately depend from one of the independent claims addressed above, which are allowable. For at least this reason, these dependent claims are also allowable.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful

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in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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I hereby certify that this correspondence is being submitted by facsimile transmission to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, to the following facsimile number.

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